



COCHILCO
Ministerio de Minería

Gobierno de Chile

International Seminar on Impurities in Copper
Raw Material

Regulations and Social Receptivity about Impurities in Copper Raw Material

Chilean situation at 2018

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Why to care about impurities in copper mineral?

- Chile apply to become OECD member.
- Environmental challenges to face reported in the Environmental Performance Review (2005).

Recommendations:

- make further progress with the implementation of air quality programmes, including those concerning the mining sector and those focusing on PM_{2.5}, PM₁₀ and ozone; monitor progress and the programmes' impact on health through appropriate indicators;
- develop nationwide emission standards (e.g. for a range of industrial sources and for toxic air pollutants);
- develop air monitoring in all major cities and an integrated air data management system;
- develop energy efficiency measures for all aspects of energy consumption;
- review the future energy supply mix (including contingency plans), taking into account environmental concerns (such as emissions of air pollutants and greenhouse gases);
- implement air, traffic and transport management plans in the Metropolitan Region; develop and implement improved plans to reduce emissions from transport in all cities.



ENVIRONMENTAL PERFORMANCE REVIEWS

CHILE

CONCLUSIONS AND RECOMMENDATIONS

- 2011: Thermoelectric Regulation (air pollution)
- 2013: Copper Smelters Emission Regulation (air pollution)

Smelting and refining facilities in Chile

There are 7 smelters in Chile, and 3 of them also have refinery (Chuquicamata, Potrerillos, and Ventanas).

Smelter	Owner	Stated
Chuquicamata	CODELCO	1952
Altonorte	Glencore-Xtrata	1993
Potreriillos	CODELCO	1927
Hernán Videla Lira	ENAMI	1952
Ventanas	CODELCO	1965
Chagres	Anglo American	1960
Caletones	CODELCO	1922



Copper Smelters Emission Regulation: process and criteria

- Emission standard in copper smelters and other arsenic emission sources (DS 28/2013).
- Principles behind this regulation:
 - Right to live in a sound environment.
 - Protect human health and environment.
 - Compliance graduality.
- Criteria to reach the final regulation:
 - Technical, Economic and Social assessment.
 - Status of existing smelters technology.
 - Emission elements toxicity and impacts.
 - Existing Environmental Instrument efficiency and effectiveness.
 - International benchmark of air emission regulations.



Hernán Videla Lira Smelter

Environmental context: Emission standard in smelters

Emission standard in copper smelters and other arsenic emission sources (DS 28/2013)

Goals:

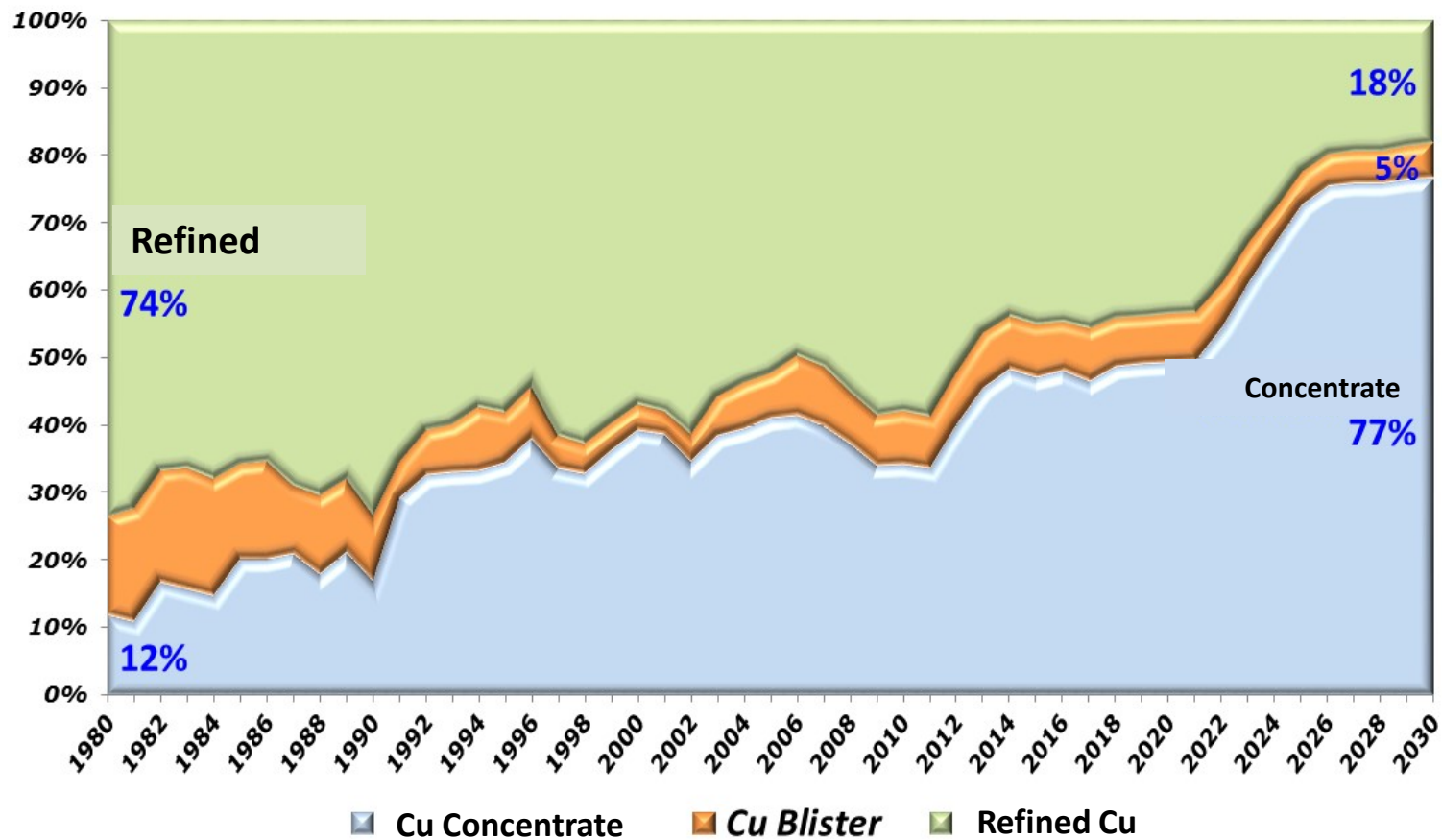
- To protect human and environmental health in all national territory.

Result of its implementation:

- Air emissions of particulate matter (**PM**), sulfur dioxide (**SO₂**), arsenic (**As**) and mercury (**Hg**) **will be reduced**.

Economic context: Chilean situation

Share by product in Chilean copper exports



Emission standard for existing facilities:

- Maximum limit of Arsenic emissions in existing smelters:

Emission Source	As (ton/yr)	Deadline
Chuquicamata	476	2018
Altonorte	126	2016
Potreros	157	2018
Hernán Videla Lira	17	2018
Ventanas	48	2016
Chagres	35	2016
Caletones	130	2018

Arsenic capture must be at least **95%**

- Maximum limit of Arsenic emissions in existing smelting chimney:
 - Acid plant: 1mg/Nm³ (monthly)
 - Slug cleaning furnace: 1mg/Nm³ (monthly)

Emission standard for new facilities:

- Maximum limit of Arsenic emissions in new smelters: 2% in weight of As and capture at least 99,97%.
- Maximum limit of Arsenic emissions in new smelting chimney:
 - Acid plant: 1mg/Nm³ (monthly)
 - Slug cleaning furnace: 1mg/Nm³ (monthly)
- Starting compliance deadline: from the beginning of operation.

Future of smelters and refineries in Chile

Low tech & economic performance

+

Higher environmental standards requirements

=

Need of a change in the smelter and refinery industry in Chile to reach:

→ Higher added value

→ More sustainable industry

→ Higher productivity and efficiency

→ Recovery of valuable materials from concentrates

Challenges

- Copper concentrate in Chile:
 - Comes from deeper and older mines.
 - Contains more complex substances that the market sanction in price or is not accepting them at all.
- Additionally, new regulations may affect the management, storage, transport of certain substances.



Challenges

- International initiatives targeting several substances that are risky to Human health and/or Environment:
 - Minamata Convention
 - IMO
 - Basel Convention
- This tendency affect not only producers but consumers.
- Access to minerals is becoming more challenging.
- National regulations are more restrictive and international commitments (OECD).
- Stakeholders are more empowered.



Opportunities

- Copper demand is still growing.
- Chile has the capacity and expertise to supply that demand.
- DS 28/2013 has started a great discussion regarding the role of Chile in smelting and refinery market.
- Changes in the copper production structure involves new challenges for Chilean industry.



Opportunities

- The answer would be:
 - Compliance with environmental rules is not under discussion. Either national or international.
 - New exploration campaigns are a must.
 - Technology and innovation should be a big focus for industry to face complex minerals.
 - Big financial and technical efforts to achieve new regulations (local and global).
 - Jump up to the new standards of production: copper concentrates are not a commodity anymore.





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